Abstract

Title: Acute neuroinflammatory reaction after focal cerebral ischemia

Aim: The aim of this thesis is to evaluate neuroinflammatory response after focal cerebral cortical ischemia. Also, familiarizing with the method of displaying damage of blood brain barriers, neurons and the possibility of detection of microglia cells as a marker of acute neuroinflammatory processes.

Methodology: This is an experimental study. We brought about cortical cerebral ischemia in rats using an application of photosensitive dye "bengal red," and a green laser. Two animals were were given the additional application of "Evans blue" in order to visualize the defects of the blood brain barrier. The animals were returned to their cage for the time needed before they were induced terminal anesthesia. This was followed by the process of brain perfusion, slicing the brain in sections 50 μm thick and then applied these sections onto slides. Sections with applied EB were immediately analyzed under the microscope. Sections to illustrate neuronal death were immunohistochemically stained via the Nissl method. Sections visualizing microglial activity were stained using CD11b antibody.

Results: Following the induction of focal ischemia there occured brain tissue damage. In the vicinity of lesion there is degeneration of neurons and damage to the blood brain barrier, which increases its permeability to the macromolecular substances. Furthermore, microglia cells were activated, which quickly catered to the neuroinflammatory processes in the area of the damaged tissue.

Key words: blood brain barrier, neurovascular coupling, cerebral ischemia, inflammation